

CLAIM AMENDMENTS

1. (Canceled) A method of minimizing stress concentration points in metal and alloy surface cracks, scratches, gouges, machine tool marks, manufacturing irregularities, and holes especially at small radii by cleaning and application of an etch appropriate for the metal or alloy to minimize the stress intensity factor in tension, shear, or compression to thus mitigate or prevent crack propagation that can result in overstress failures, impaired flexibility without failure, and short fatigue life.
2. (Canceled) A process that employs the combination of an appropriate etch as described in Claim 1 and a corrosion preventive surface treatment as described in claim two to synergistically mitigate or prevent crack growth or propagation that therefore will result in increased strength, increased flexibility, and increased fatigue life.
3. (Canceled) A surface treatment using a corrosion preventive compound to mitigate or prevent corrosion reactions (primarily during tension, shear, or compression) at tips of metal and alloy surface cracks, scratches, gouges, machine tool marks or manufacturing imperfections to prevent crack growth at the said stress concentration points where the metal to metal bonds become energized with potential energy that can contribute to the activation energy required to cause a corrosive chemical reaction that may promote crack growth or propagation thus reducing the cross sectional area of the metal and loss of strength, restricted flexibility, and short fatigue life.
4. (New) A method of treating a metal surface with a liquid, water immiscible and water displacing corrosion preventive compound, comprising the steps of:

cleaning, rinsing, and drying the surface of the metal to remove mill scale, soils, oils, corrosion products, or previous coatings to expose as much of the surface as possible so

said corrosion preventive compound can penetrate to all apexes of cracks, scratches, and gouges, where stress concentrations or stress intensity factor exist, whereby water or moisture at said apexes, is displaced and said compound protects the metal-to-metal bonds at the apexes when said bonds are stretched and possess elastic potential energy that in contrast with untreated metal-to-metal bonds the chemical activation energy level for corrosion could be exceeded and fail.

5. (New) A metal surface treatment as set forth in claim 4, including the application of an etch appropriate for the metal, comprising the steps of:

- (a) applying the etch by brushing, rolling, spraying, or dipping for discrete times as appropriate for the metal;
- (b) rinsing with water; and
- (c) drying the treated metal;

whereby said etch increases the apex radii of cracks, gouges, scratches, etc. to minimize stress intensity factors and distribute forces and potential energy from internal or external stresses to more metal-to-metal bonds than at the unetched apex radii locations so that stress intensity factors and bond potential energy levels are reduced in contrast with unetched surfaces and said bond potential energy is less to avoid the activation energy required to initiate metal-to-metal bond failure.

6. (New) A method of metal surface treatment processes as set forth in claim 5, embodying the use of a surface etch, followed by the surface treatment with a liquid corrosion preventive compound whereby the strength, flexibility, and fatigue life of the metal are

increased in contrast with the normally expected metal strength, flexibility, and fatigue life of metal not treated by said technology.